Remarks

Claims 1-25 are in the application, of which only claim 1 is in independent form. Claims 1, 4, 10, 11, 15, 17, and 18 are amended, and claims 24 and 25 are new.

In the specification, paragraph [0018] is amended to correct a typographical error.

Claims 1, 2, 4, 5, 8, and 10-23 stand rejected under 35 USC § 102(b) for anticipation by Cordingley et al., U.S. Publication No. 2002/0167581. (Applicants note that claim 10 depends on claim 9, which stands rejected for obviousness. Claim 10 cannot, therefore, be properly rejected for anticipation; there is no other pending rejection of claim 10.) Applicants traverse this rejection for the following reasons.

To support her position, the Examiner points to several passages of Cordingley et al., certain ones of which applicants analyze below.

The Abstract describes locally processing a predetermined microstructure formed on a substrate without causing undesirable changes in electrical or physical characteristics of the substrate or other structures formed on it. Paragraph [0025] states that the processing occurs with multiple pulses in a single pass operation of a thermal processing system. "The processing removes the at least one microstructure without damaging the substrate." (*Id.*, 4th sentence.) Paragraph [0036] states that "[t]wo pulses may be used to completely process the at least one microstructure, and the laser energy of each of the pulses is about 60-70% of laser energy required for laser processing the at least one microstructure with a single pulse."

The foregoing passages reveal that "processing" as defined by Cordingley et al. refers to removal of at least one microstructure and that the two laser pulses described contribute at least partly to microstructure material removal.

Independent claim 1 of the present application, which is the only independent claim, recites applying heating energy to a target material location to elevate its temperature while substantially maintaining the dimensional stability property of the target material. The result is increased throughput. This differs from Cordingley et al., which applies laser pulses to "process" (*i.e.*, at least partly remove) the target microstructure and leave intact the substrate and other structures formed on it. Clearly, none of the laser pulses applied by Cordingley et al. to the target microstructure has or is intended to have properties that maintain the dimensional stability of the target structure. Cordingley et al. seeks to at least partly rupture the target microstructure with each laser pulse applied to it. Cordingley et al. apparently does not contemplate an increase in throughput. Applicants

submit, therefore, that the anticipation rejection of claim 1 and its dependent claims 2, 4, 5, 8, and 10-23 is improper and request that it be withdrawn.

Applicants have amended claim 1 to remove an express recitation of certain processing laser beam parameters to streamline the language and remove limitation to a pulsed processing laser beam. Applicants have amended also claims 4 and 10 to recite laser pulse width ranges, claim 11 to correct a typographical error, claim 15 to clarify its language, and claims 17 and 18 to recite clear antecedent bases. Applicants have added new claims 24 and 25 to expressly cover, respectively, pulsed light beam heating energy and pulsed processing laser output.

Claim 3 stands rejected under 35 USC § 103(a) for obviousness over Cordingley et al., for the reasons stated in the anticipation rejection, and further in view of Owen et al., U.S. Patent No. 5,841,099. The Examiner relies on Owen et. al. for use of a Q-switched laser to drill vias and blind vias in multilayer materials. Claim 9 stands rejected for obviousness over Cordingley et al. for the reasons stated in the anticipation rejection, and further in view of Fahey et al. International Publication No. WO 03/002289 A1. The Examiner relies on Fahey et al. for disclosure of dicing of wafers using an IR laser of differing wavelengths. Finally, claims 6 and 7 stand rejected for obviousness over Cordingley et al. for the reasons stated in the anticipation rejection, and further in view of general knowledge of wavelength range selection criteria based on processing operations needed.

Because each of the obviousness rejections is premised on the Examiner's reasons for relying on Cordingley et al., applicants rely on their arguments traversing the anticipation rejection to dispute the obviousness rejections. None of the secondary references cited changes the fundamental teaching of Cordingley et al. to use each of multiple laser pulses to at least partly remove material from a target microstructure.

Applicants believe their application is in condition for allowance and respectfully request the same.

Respectfully submitted,

Yunlong Sun, Liu Jingjiao, Richard S. Harris, Pradeep Subrahmanyan, Robert F. Hainsey, and Weixiong Lu

By _____
Paul S. Angello
Registration No. 30,991

STOEL RIVES LLP
900 SW Fifth Avenue, Suite 2600
Portland, OR 97204-1268
Telephone: (503) 224-3380
Facsimile: (503) 220-2480
Attorney Docket No. 50001/91:2